



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/888,642	06/26/2001	Toshio Haba	500.40269X00	9091
20457	7590	07/12/2004	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889				WONG, EDNA
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 07/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory Action	Application No.	Applicant(s)
	09/888,642	HABA ET AL.
	Examiner Edna Wong	Art Unit 1753

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 25 June 2004 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

a) The period for reply expires 3 months from the mailing date of the final rejection.
 b) The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
 ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. The proposed amendment(s) will not be entered because:
 - (a) they raise new issues that would require further consideration and/or search (see NOTE below);
 - (b) they raise the issue of new matter (see Note below);
 - (c) they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
 - (d) they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____.

3. Applicant's reply has overcome the following rejection(s): _____.
4. Newly proposed or amended claim(s) ____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
5. The a) affidavit, b) exhibit, or c) request for reconsideration has been considered but does NOT place the application in condition for allowance because: See pages 2-14.
6. The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.
7. For purposes of Appeal, the proposed amendment(s) a) will not be entered or b) will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: _____.

Claim(s) objected to: _____.

Claim(s) rejected: 3,9 and 12-24.

Claim(s) withdrawn from consideration: 1,2,7,8,10 and 11.

8. The drawing correction filed on ____ is a) approved or b) disapproved by the Examiner.

9. Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____.

10. Other: _____.


 Edna Wong
 Primary Examiner
 Art Unit: 1753

ADVISORY ACTION

This is in response to the Amendment dated June 25, 2004. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Arguments

Election/Restrictions

This application contains claims **1-2, 7-8 and 10-11** drawn to an invention nonelected without traverse in the Amendment dated September 22, 2003.

Applicants state that since claim 13 reads on each of the species, e.g., individually, it clearly constitutes a generic claim. Accordingly, Applicants respectfully decline to cancel the claims directed to the non-elected species claims, retaining such claims pending resolution as to allowability of generic claim 13, and respectfully traverse the requirement by the Examiner that a complete reply must include cancellation of non-elected claims or other appropriate action. In response:

Applicants' election of specie (c), compounds represented by the formula I, in Paper No. 4 has been considered for patentability (i.e., claims 3, 9 and 12-24).

Applicants' nonelected species of cyanine dyes and indolium compounds have not been considered for patentability.

Claim Objections

Claims **3, 9, 13, 17 and 19** have been objected to because of minor informalities.

The objection of claims 3, 9, 13, 17 and 19 has been withdrawn in view of Applicants' amendment.

Applicants state that by raising new objections in the Office Action mailed March 25, 2004, in connection with recitations that were not amended in the Amendment filed February 17, 2004, the Examiner could not have properly made the Office Action mailed March 25, 2004, a Final rejection. Accordingly, withdrawal of the Finality of the Office Action mailed March 25, 2004, is proper.

In response, the new claim objections were made based on a matter of form. If the Applicants' really wanted it, they could have left the claims as originally presented. It was in the Examiner's mind to have Applicants' present the claims in better form for Appeal.

Furthermore, the practical difference between a rejection and an objection is that a rejection, involving the merits of the claim, is subject to review by the Board of Patent Appeals and Interferences, while an objection, if persisted, may be reviewed only by way of petition to the Commissioner.

Claim Rejections - 35 USC § 112

I. Claim **13** has been rejected under 35 U.S.C. 112, first paragraph.

The rejection of claim 13 under 35 U.S.C. 112, first paragraph, has been

withdrawn in view of Applicants' amendment.

II. Claims **15-22 and 24** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection of claims 15-22 and 24 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 103

Solution

I. Claims **3, 9 and 16-19** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **King et al.** (US Patent No. 5,174,886) in combination with **Gerenrot et al.** ("Effect of the Structure of Carbocyanine Dyes on the Leveling Power During the Electrodeposition of Copper", *Zashchita Metallov* (1972), Vol. 8, No. 3, pp. 338-342).

The rejection of claims 3, 9 and 16-19 under 35 U.S.C. 103(a) as being unpatentable over King et al. in combination with Gerenrot et al. is as applied in the Office Action dated March 25, 2004 and incorporated herein. The rejection has been maintained for the following reasons.

II. Claim **20** has been rejected under 35 U.S.C. 103(a) as being unpatentable over **King et al.** (US Patent No. 5,174,886) in combination with **Gerenrot et al.** ("Effect of the

Structure of Carbocyanine Dyes on the Leveling Power During the Electrodeposition of Copper", *Zashchita Metallov* (1972), Vol. 8, No. 3, pp. 338-342) as applied to claims 3, 9 and 16-19 above, and further in view of **Barbieri et al.** (US Patent No. 4,555,315) and **Barstad et al.** (US Patent No. 6,444,110 B2).

The rejection of claim 20 under 35 U.S.C. 103(a) as being unpatentable over King et al. in combination with Gerenrot et al. as applied to claims 3, 9 and 16-19 above, and further in view of Barbieri et al. and Barstad et al. is as applied in the Office Action dated March 25, 2004 and incorporated herein. The rejection has been maintained for the following reasons.

III. Claims **13 and 15** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **King et al.** (US Patent No. 5,174,886) in combination with **Gerenrot et al.** ("Effect of the Structure of Carbocyanine Dyes on the Leveling Power During the Electrodeposition of Copper", *Zashchita Metallov* (1972), Vol. 8, No. 3, pp. 338-342).

The rejection of claims 13 and 15 under 35 U.S.C. 103(a) as being unpatentable over King et al. in combination with Gerenrot et al. is as applied in the Office Action dated March 25, 2004 and incorporated herein. The rejection has been maintained for the following reasons.

Process

IV. Claims **12 and 23** have been rejected under 35 U.S.C. 103(a) as being

unpatentable over **Landau** (US Patent No. 6,261,433 B1) in combination with **Gerenrot et al.** ("Effect of the Structure of Carbocyanine Dyes on the Leveling Power During the Electrodeposition of Copper", *Zashchita Metallov* (1972), Vol. 8, No. 3, pp. 338-342).

The rejection of claims 12 and 23 under 35 U.S.C. 103(a) as being unpatentable over Landau in combination with Gerenrot et al. is as applied in the Office Action dated March 25, 2004 and incorporated herein. The rejection has been maintained for the following reasons.

V. Claims **14 and 24** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Landau** (US Patent No. 6,261,433 B1) in combination with **Gerenrot et al.** ("Effect of the Structure of Carbocyanine Dyes on the Leveling Power During the Electrodeposition of Copper", *Zashchita Metallov* (1972), Vol. 8, No. 3, pp. 338-342).

The rejection of claims 14 and 24 under 35 U.S.C. 103(a) as being unpatentable over Landau in combination with Gerenrot et al. is as applied in the Office Action dated March 25, 2004 and incorporated herein. The rejection has been maintained for the following reasons.

VI. Claim **21** has been rejected under 35 U.S.C. 103(a) as being unpatentable over **Landau** (US Patent No. 6,261,433 B1) in combination with **Gerenrot et al.** ("Effect of the Structure of Carbocyanine Dyes on the Leveling Power During the Electrodeposition of Copper", *Zashchita Metallov* (1972), Vol. 8, No. 3, pp. 338-342).

The rejection of claim 21 under 35 U.S.C. 103(a) as being unpatentable over Landau in combination with Gerenrot et al. is as applied in the Office Action dated March 25, 2004 and incorporated herein. The rejection has been maintained for the following reasons.

VII. Claim 22 has been rejected under 35 U.S.C. 103(a) as being unpatentable over **Landau** (US Patent No. 6,261,433 B1) in combination with **Gerenrot et al.** ("Effect of the Structure of Carbocyanine Dyes on the Leveling Power During the Electrodeposition of Copper", *Zashchita Metallov* (1972), Vol. 8, No. 3, pp. 338-342).

The rejection of claim 22 under 35 U.S.C. 103(a) as being unpatentable over Landau in combination with Gerenrot et al. under 35 U.S.C. 103(a) as being unpatentable over Landau in combination with Gerenrot et al. is as applied in the Office Action dated March 25, 2004 and incorporated herein. The rejection has been maintained for the following reasons.

⌘ Applicants state that they rely on evidence in their specification showing unexpectedly better results, the Examiner has not commented on this evidence, in the Office Action mailed March 25, 2004. Such failure to comment on evidence properly before the Examiner is clearly improper. It is respectfully submitted that, when properly taken into account, this evidence further supports the conclusion of unobviousness of the presently claimed subject matter. In response:

Solution

The unexpected results does not compositionally distinguish the solution from the prior art.

Process

The evidence presented in Applicants' specification, Table 1 (page 17) and Table 2 (page 21), disclose the results of electroplating with specific copper electroplating solution compositions. These specific copper electroplating solution compositions and electroplating conditions are not recited or used in the present process claims, and thus, the present process claims read on using the copper electroplating solution compositions as disclosed in the prior art.

⌘ Applicants state that King does not disclose nor would have suggested, such a plating solution, or use thereof, as in the present invention, including, inter alia, both the additive (in particular, (a) at least one of the compounds represented by the general formula (1) and (b) one or more polyethers, organic sulfur compounds and halide ions), as in the present claims, and advantages achieved thereby. In response, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The reason or motivation to modify the reference may often suggest what the

inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991); *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991) and MPEP § 2144.

⌘ Applicants state King also would have neither disclosed nor would have suggested the other features of the present invention, including, inter alia, filling the inside of the features with copper (note, for example, claims 12 and 20), and/or wherein the additive (or the compound represented by the general formula; (1)) suppresses an electroplating reaction during use of the copper electroplating and is consumed as the electroplating reaction plating solution for electroplating reaction proceeds, with a diffusion rate thereof being lower than a rate of reaction thereof during use of the copper electroplating solution for electroplating (note, e.g., claims 15 and 16, note also claims 21 and 22). In response:

Solution

Filling the inside of the features with copper does not compositionally distinguish the solution from the prior art.

Wherein the additive suppresses an electroplating reaction during use of the

copper electroplating and is consumed as the electroplating reaction plating solution for electroplating reaction proceeds, with a diffusion rate thereof being lower than a rate of reaction thereof during use of the copper electroplating solution for electroplating, the function of the additive does not compositionally distinguish the solution from the prior art.

Process

King teaches a process for plating a printed circuit board containing through holes, wherein the ratio of the printed circuit board thickness to diameter of at least one of the through holes is greater than 3 to 1 (col. 2, lines 19-36). The through holes disclosed by King are features being filled with copper.

Gerenrot teaches polymethine dyes (esp., page 339, No. 5) as leveling agents in a copper electroplating solution (abstract). King discloses that his copper electroplating solution may contain a conventional leveling agent (col. 3, lines 55-57). Thus, it is deemed to be well within the skill of the ordinary artisan to have used at least one of the polymethine dyes disclosed by Gerenrot as the leveling agent disclosed by King.

Wherein the additive suppresses an electroplating reaction during use of the copper electroplating and is consumed as the electroplating reaction plating solution for electroplating reaction proceeds, with a diffusion rate thereof being lower than a rate of reaction thereof during use of the copper electroplating solution for electroplating, it has been held that a newly discovered use or function of components does not necessarily

mean the system is unobvious since this use or function may be inherent in the prior art.

Ex parte Pfeiffer 135 USPQ 31.

⌘ Applicants state that the claim recitations constitute specific recitations in connection with the materials used and in connection with the processing, which must be considered in determining patentability. That is, for example, claim 15 defines a property of the additive, which can compositionally distinguish the bath from prior art. It is respectfully submitted that this property of the additive must be considered in determining patentability. In response, the Examiner deems that the No. 5 polymethine dye on page 339 of Gerenrot has the property as presently claimed because it is the same compound as presently claimed. Therefore, why wouldn't this additive have the property in the copper electroplating solution of King?

⌘ Applicants state that the Examiner has not established inherency, in the electroplating bath and process disclosed or suggested by the prior art, of claimed features of the present invention. In response:

Solution

To show inherency of the suppression, consumption and diffusion rate of the compounds represented by the general formula (I) in the copper electroplating solution, the ordinary artisan would have to add the No. 5 polymethine dye on page 339 of Gerenrot to the copper electroplating solution of King.

The Examiner deems that the No. 5 polymethine dye on page 339 of Gerenrot has the property as presently claimed because it is the same compound as presently claimed. Therefore, why wouldn't this additive have the property in the copper electroplating solution of King?

Process

To show inherency of the suppression, consumption and diffusion rate of the compounds represented by the general formula (I) in the process, the ordinary artisan would have to add the No. 5 polymethine dye on page 339 of Gerenrot to the copper electroplating solution of King and perform the process of filling the inside of features with copper by electroplating. The Examiner will have to rely on the Appeal Board's decision on inherency on this issue since she cannot perform this process at the PTO.

❖ Applicants state that Gerenrot discloses the results of a study of the relation between the structure of polymethine dyes and their leveling power during copper electrodeposition from acid solutions. The article discloses that the greatest leveling power was obtained with carbocyanines with the highest basicity. In response, the disclosure of reference must be considered for what it fairly teaches one of ordinary skill in the art, pertinence of non-preferred disclosure must be reviewed in such light. *In re Meinhardt* 157 USPQ 270; and MPEP § 2123.

- ✿ Applicants state that one of ordinary skill in the art concerned with in King et al., looking to high-throw plating baths, would not have looked to baths with leveling power as in Gerenrot. In response, King discloses that his copper electroplating solution may contain a conventional leveling agent (col. 3, lines 55-57). Thus, it is deemed to be well within the skill of the ordinary artisan to have looked in Gerenrot for a conventional leveling agent for King's copper electroplating solution.
- ✿ Applicants state that only through the disclosure of the present invention would one of ordinary skill in the art concerned with in King, et al. have looked to materials as in Gerenrot. In response, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).
- ✿ Applicants state that the combined teachings of King and of Gerenrot would have neither taught nor would have suggested the present invention, including advantages thereof in improved plating in high aspect ratio features. In response, King teaches a process for plating a printed circuit board containing through holes, wherein the ratio of the printed circuit board thickness to diameter of at least one of the through holes is

greater than 3 to 1 (col. 2, lines 19-36). The through holes disclosed by King are features being filled with copper.

“High aspect ratios” are not presently claimed. It is well settled that unpatented claims are given the broadest, most reasonable interpretation and that limitations are not read into the claims without a proper claim basis therefor. *In re Prater* 415 F. 2d 1393, 162 USPQ 541 (CCPA 1969); *In re Zeltz* 893 F. 2d 319, 13 USPQ 1320.

- ✿ Applicants state that if the teachings of Barbieri, et al. and Barstad, et al. were properly combinable with the teachings of King, et al. and Gerenrot, such combined teachings would have neither disclosed nor would have suggested the presently claimed subject matter. In response, Applicants' remarks have been fully considered but they are not deemed to be persuasive.

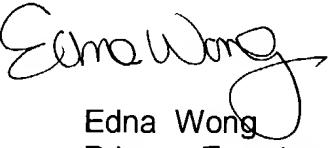
- ✿ Applicants state that if the teachings of Landau and of Gerenrot were properly combinable, such combined teachings would have neither disclosed nor would have suggested the presently claimed process. In response, Applicants' remarks have been fully considered but they are not deemed to be persuasive.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 5:00 pm, alt.

Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Edna Wong
Primary Examiner
Art Unit 1753

EW
July 8, 2004